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Applicants McCallister, et al.

Serial No.: 10/718,507

Group Art Unit: 2637

Filed: November 19, 2003

Examiner: CORRIELUS, Jean B.

For: CONSTRAINED-ENVELOPE DIGITAL-COMMUNICATIONS TRANSMISSION SYSTEM AND METHOD THEREFOR

INVENTOR'S SUBMISSION UNDER 37 C.F.R. 1.56

I, Ronald D. McCallister, a named inventor in the above-identified reissue application, make the following disclosure pursuant to my obligation under 37 C.F.R. 1.56 to make known to the Patent Office any information believed material to the issue of patentability or that refutes or is inconsistent with a position the applicant takes in asserting an argument of patentability. I am not currently affiliated with the assignee of the application and have no interest in the application.

Initially, the Examiner's acknowledgement of my prior submission dated July 6, 2005 is appreciated. In light of a further position taken by the applicant, I believe it necessary to make this further submission pursuant to my disclosure obligation.

My disclosure concerns the May et al. prior art reference ("Reducing the Peak-to-Average Power Ratio in OFDM Radio Transmission Systems," published May 18, 1998 in the Proceedings of the 1998 Vehicular Technology Conference), which is of record in the application.

All of the pending claims of the application recite either a linearizer or linearizing limitations (Note: the dependency of claims 43 and 44 appears to be incorrect but are assumed to correctly depend from a claim reciting a linearizer or linearizing limitations). In an Office Action dated November 29, 2005, the Examiner stated that "applicant representative admitted that May et al. teaches every feature of the claimed invention but does not teach the inclusion of a linearizer or linearizing limitations in all the claims either directly or through dependency." The Examiner was referring to applicant's remarks in a Preliminary Amendment dated November 19, 2003. In an Amendment dated May 30, 2006, the applicant took issue with the Examiner's November 29, 2005 statement. The basis for applicant's disagreement with the Examiner's statement is not readily apparent.

However, irrespective of the applicant's current position, I believe the present characterization of May as not describing a linearizer or linearizing limitations may not be accurate.

The May reference states:

> "In most of the publications about amplitude limitation of OFDM signals it is assumed that it can be achieved by predistortion of the signal that the amplifier behaves like an ideal limiter. This means that the signal is amplified linearly up to a maximal input amplitude A_O and larger amplitudes are limited to A_O, see Fig. [1]. Based on this assumption, we also model the amplifier as an ideal limiter with amplitude threshold A_O in this paper." (P. 1, col. 1) (emphasis added).

Thus, it is my belief that the statement "the signal is amplified linearly," in the context of the May disclosure, would clearly be appreciated by a person of ordinary skill in the art as describing the claimed linearizer or linearizing limitations. In addition, Figure 1 of May, duplicated below, shows linearization up to a maximal input amplitude.

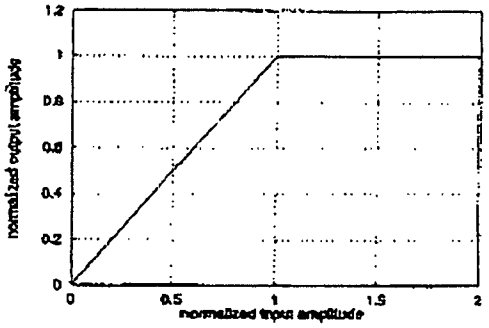

Fig. 1. Ideal limiter with normalized input and output amplitude, maximal input amplitude $A_0 = 1$

Respectfully submitted,

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Applicant(s): McCallister, et al.

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For: CONSTRAINED-ENVELOPE DIGITAL-COMMUNICATIONS TRANSMISSION SYSTEM AND METHOD THEREFOR

INVENTOR'S SUBMISSION UNDER 37 C.F.R. 1.56

I, Ronald D. McCallister, a named inventor in the above-identified reissue application, make the following disclosure pursuant to my obligation under 37 C.F.R. 1.56 to make known to the Patent Office any information that refutes or is inconsistent with a position the applicant takes in asserting an argument of patentability. I am not currently affiliated with the assignee of the application and have no interest in the application.

My disclosure concerns the May et al. prior art reference[1], which is of record in the application.

All of the pending claims of the application recite either a delay element or delaying step. The applicant argued that the May reference "does not discuss or suggest a delay element or delaying step" (Preliminary Amendment, November 19, 2003). It has come to my attention that the pending claims have been allowed based on the applicant's characterization of the May reference as not requiring that the signal be delayed. I respectfully disagree with the applicant's characterization.

The May paper teaches that you must identify the instant in time in which a signal peak occurs, and then subtract a scaled version of a fixed pulse-shape from the input signal, where the peaks of the pulse-shape and the signal have been time-aligned[2]. Since the pulse-shape extends in both directions in time from the point at which its peak occurs, the teaching clearly requires that the input signal is delayed by at least half of the pulse-shape duration. In view of the foregoing, it is clear that May's approach inherently uses a delay; in my opinion it cannot be done any other way.

The following Figure 1 graphically depicts the necessity for signal delay in implementing May's teaching.

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[1] T. May and H. Rohling, "Reducing the Peak-to-Average Power Ratio in OFDM Radio Transmission Systems," published May 18, 1998 in the Proceedings of the 1998 Vehicular Technology Conference, pp. 2474-2478.

[2] Ibid, p. 2475, col. 2, lines 39 -41 (the three equations at the bottom of the second column).

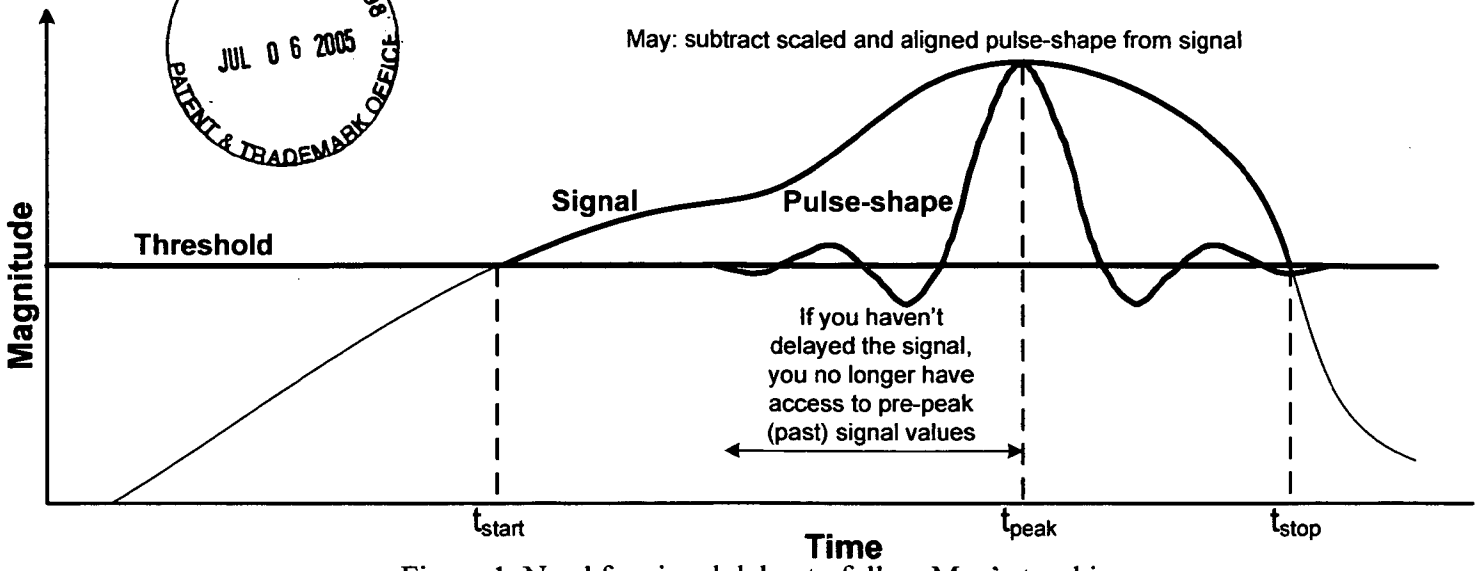

Figure 1. Need for signal delay to follow May's teaching

Figure 1 shows signal magnitude over a time interval. At time t_{start} the signal magnitude exceeds the defined threshold, and this condition persists until the signal magnitude once again drops below that threshold at time t_{stop}. The signal magnitude exhibits a peak at time, t_{peak}. May clearly teaches that the scaled bandlimited pulse-shape must be time aligned so that the pulse peak and the signal peak are time-coincident[3], the scaling defined so that the magnitude of the difference between the signal and the pulse equals the threshold at that peak instant[4]. May then clearly instructs that the scaled and aligned pulse values must be subtracted[5] from the corresponding signal values. It is impossible to follow May's teaching without the use of signal delay. In order to subtract pulse values from signal values, all required signal values must be accessible. However, at that point in time (t_{peak}) when this subtraction action is prescribed, all the signal values in the past (left of the peak instant) have already occurred. To follow May's specific instructions to subtract pulse values from ***all*** (to both sides of the peak instant) corresponding signal values, delay must be used to make sure that past signal values are still available.

Respectfully submitted,

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Dated: July 5, 2005

[3] Ibid, p. 2475, col. 2, lines 40 -41 (the last two of the three equations at the bottom of the second column).
[4] Ibid, p. 2475, col. 2, lines 41 (the last of the three equations at the bottom of the second column).
[5] Ibid, p. 2475, col. 2, lines 39 (the first of the three equations at the bottom of the second column).